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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/588,548	06/07/2000	Eiji Suematsu	0033-0662P	9172

7590 10/07/2004

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EXAMINER	
NGUYEN, DUC M	

ART UNIT	PAPER NUMBER
2685	

DATE MAILED: 10/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/588,548	SUEMATSU, EIJI	
	Examiner	Art Unit	
	Duc M. Nguyen	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *02 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *25-45* is/are allowed.

6)☒ Claim(s) *1-24,46 and 47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/20/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to applicant's response filed on 6/2/04. Claims 1-47 are now pending in the present application.

Petition and Restriction

1. The petition filed on 6/2/04 is treated as Applicant's argument with traverse regarding the restriction requirement. Since Applicant's arguments are persuasive, the restriction requirement made in the Office action mailed on 11/20/03 is hereby withdrawn. Claims 1, 3-11 and 17-45, previously withdrawn from consideration as a result of a restriction requirement, are now subject to being rejoined. Claims 1, 3-11 and 17-45 are hereby rejoined and fully examined for patentability.

Information Disclosure Statement

2. The references listed in the information disclosure statements submitted on 5/20/04 has been considered by the examiner (see attached PTO-1449).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims **1-3** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Sasaki** (US 4,965,852).

Regarding claims **1-3**, **Sasaki** discloses a transmitter comprising:

-a plurality of input modulation signals on a frequency axis independent of each other (see Fig. 6, col. 4, line 38-50 and col. 5, lines 3-18);

-frequency converting at least one of the plurality of input modulation signals (see mixer 74);

-frequency arranging circuit to generate a multiplex signal as claimed (see multiplexer 78);

and a receiver comprising

-frequency up-converter as claimed (see mixer 79);

-transmission circuit as claimed (see refs. 81, 82).

-reception circuit as claimed (see lower portion of Fig. 6);

-frequency down converter as claimed (see mixer 86);

-frequency rearranging circuit as claimed (see Fig. 6 and col. 4, lines 51-61).

Here, although Sasaki fails to disclose the transmission signal is in millimeter wave bands, it would have been obvious to one skilled in the art at the time the invention was made to modify Sasaki for providing frequency ranges as claimed, for conforming to FCC regulations (i.e, licensed bandwidth allocation).

5. Claims **4-5, 8-18, 21-24, 46-47** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Sasaki** in view of **Roder** (US Patent Number **2,233,183**).

Regarding claims **4, 12, 17, Sasaki** discloses all the claimed limitations, see claims 1-3 above, except that one of the plurality of input modulation signals without frequency conversion is combined with other up-converted signals to form a multiplex signal. However, **Roder** discloses a frequency modulation system wherein one of the plurality of input modulation signals without frequency conversion is combined with other up-converted signals to form a multiplex signal (see Signal No. 1 in Fig. 3). Since the input modulation signal without frequency conversion comprises a frequency which differs from the other up-converted signals and can be recovered as well (see Roder, Fig. 4), it would have been obvious to one skilled in the art at the time the invention was made to provide the above teaching Roder to Sasaki for incorporating such input modulation signal as one of components of the multiplex signal as well, for eliminating a local oscillator, thereby resulting in cost saving.

Regarding claim **5,** it is rejected for the same reason as set forth in claim 4 above. In addition, since **Sasaki** discloses a bandpass filter for filtering image frequency signals, and since the image frequency of a transmit signal is obviously on the lower side band of the LO frequency, it is clear that such bandpass filter is obviously used to filter the image frequency of up-converted signal. Therefore, the claimed limitation is made obviously by Sasaki for providing a filter as claimed, in order to filter image frequency signals for reducing signal interferences.

Regarding claim **8,** it is rejected for the same reason as set forth in claim 4 above. In addition, it would have been obvious for providing frequency ranges as claimed, for conforming to FCC regulations (i.e, licensed bandwidth allocation).

Regarding claim **9,** it is rejected for the same reason as set forth in claim 4 above. In addition, although **Sasaki** fails to disclose a frequency multiplier or PLL is used to generate the second LO signal from the first LO, it is noted using such frequency multiplier or PLL for generating a second LO signal from a first LO is known in the art (Official Notice). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to further modify Roder to Sasaki for generating a second LO signal from a first LO as claimed, for cost saving.

Regarding claim **10,** it is rejected for the same reason as set forth in claim 9 above.

Regarding claim **11,** it is rejected for the same reason as set forth in claim 4 above. In addition, it is clear that the multiplex signal would obviously comprise user's information as claimed, in order to allow two people communicate to each other.

Regarding claim **13,** it is rejected for the same reason as set forth in claim 9 above, wherein it is clear that the PLL is used to track frequency of the receiving signal for demodulation.

Regarding claims **14-15,** they are rejected for the same reason as set forth in claim 9 above.

Regarding claim **16,** it is rejected for the same reason as set forth in claim 12 above. In addition, it is clear that the multiplex signal would obviously comprise user's information as claimed, in order to allow two people communicate to each other.

Regarding claim **18,** it is rejected for the same reason as set forth in claim 5 above.

Regarding claims **21,** it is rejected for the same reason as set forth in claim 13 above.

Regarding claims **22-23,** they are rejected for the same reason as set forth in claim 9 above, wherein it is clear that such LO generation signals would apply equally well for either transmitter or receiver.

Regarding claim **24,** it is rejected for the same reason as set forth in claim 17 above. In addition, it is clear that the multiplex signal would obviously comprise user's information as claimed, in order to allow two people communicate to each other.

Regarding claims **46-47,** they are interpreted and rejected for the same reason as set forth in claim 4 above.

6. Claims **6-7, 19-20** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Sasaki** in view of **Roder** and further in view of **Kiyanagi et al** (US Patent Number **6,185,201**).

Regarding claims **6, 19, Sasaki** as modified would disclose all the claimed limitations, see claims 5 and 18 above, except for the first LO frequency is set so that the lower side band of the upconverted signal is adjacent a higher frequency band of the second modulation signal. However, it is noted that for a multiplex communication signal comprising a plurality of carrier frequencies, the spacing between two adjacent carrier frequencies should be chosen wide enough such that their lower side bands and upper side bands should not overlap to each other to cause interferences as illustrated in **Fig. 24** of **Kiyanagi.** Here, since the carrier frequency of the second modulation

signal is lower than the carrier frequency of the upconverted signal, and since the first LO frequency is the frequency spacing between the carrier frequency of the second modulation signal and the carrier frequency of the upconverted signal, it would have been obvious to one skilled in the art at the time the invention was made to incorporate such frequency spacing design as illustrated in **Fig. 24** of Kayanagi to Roder and Sasaki for setting the first LO frequency high enough so that the lower side band of the upconverted signal is not so close to the carrier frequency of the second modulation signal, thereby resulting in that the lower side band of the upconverted signal is adjacent a higher frequency band of the carrier frequency of second modulation signal, for preventing signal interferences between signal components of a multiplex signal.

Regarding claims **7, 20,** they are rejected for the same reason as set forth in claim 4 above. In addition, it would have been obvious for providing frequency ranges of the LO as claimed, in order to convert the transmit signal to the desired frequency range, for conforming to FCC regulations (i.e, licensed bandwidth allocation).

Allowable Subject Matter

7. Claims 25-45 are allowed.

8. The following is a statement of reasons for the indication of allowable subject matter:

As to claim 25, 33, 38, the cited prior art fails to disclose or made it obvious a method or apparatus for a millimeter-wave transmitter, receiver or transceiver which comprises steps and components as specified in the claim, wherein a common

frequency conversion circuit and three parallel receiving circuits are used for demodulation the multiplex signal modulated with LO signals as specified in the claims (see Figs. 3A, 3B).

Response to Arguments

9. Applicant's arguments with respect to claim 2 has been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- **Dent** (US Patent Number 5,610,559), Dual loop frequency synthesizer having fractional divider.

- **Schwartz et al** (US Patent Number 5,930,682), Centralized channel selection in a distributed RF antenna system.

- **Spickermann** (US Patent Number 6,407,837), Use of bandwidth efficient modulation techniques in a wavelength division multiplexed optical link.

11. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for formal communications intended for entry)

(for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington VA, Sixth Floor (Receptionist).

Any inquiry concerning this communication or communications from the examiner should be directed to Duc M. Nguyen whose telephone number is (703) 306-4531, Monday-Thursday. Or to Edward Urban (Supervisor) whose telephone number is (703) 305-4385.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-4700.

Duc Nguyen

October 3, 2004